

STATE OF NORTH CAROLINA
COUNTY OF WAKE

IN THE GENERAL COURT OF JUSTICE
SUPERIOR COURT DIVISION
13-CVS-11032

STATE OF NORTH CAROLINA ex rel.
NORTH CAROLINA DEPARTMENT
OF ENVIRONMENTAL QUALITY,
DIVISION OF WATER RESOURCES,
Plaintiff,

v.

WATERKEEPER ALLIANCE,
SOUND RIVERS, WINYAH RIVERS
FOUNDATION, and CAPE FEAR
RIVER WATCH, INC.,
Plaintiff-Intervenors,

v.

DUKE ENERGY PROGRESS, LLC,
Defendant.

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BY _____

AMENDED ORDER GRANTING MOTION FOR PARTIAL SUMMARY JUDGMENT

THIS CAUSE came on before the Hon. Paul Ridgeway, Superior Court Judge presiding pursuant to designation under Rule 2.1 of the General Rules of Practice, on Motion of the Defendant, DUKE ENERGY PROGRESS, LLC ("Defendant" or "Duke Energy Progress") for Partial Summary Judgment. Following the filing of the Motion for Partial Summary Judgment, the Plaintiff-Intervenors joined in the Motion. The Plaintiff Department of Environmental Quality, Division of Water Resources, opposed the Motion for Partial Summary Judgment. A hearing was conducted on September 14, 2015. After reviewing the Motion, the Responses, the materials attached, the arguments of counsel, and the pleadings in this matter, this Court is of the opinion that the Motion for Partial Summary Judgment should be GRANTED. At the request of the Court, a further

hearing was held on February 12, 2016, to discuss the scope and conditions of an Order granting the Motion for Partial Summary Judgment, the Court having previously requested proposed orders and briefing. After considering the positions of all parties in this matter, and after argument of counsel, this Court now GRANTS the Motion for Partial Summary Judgment as set forth in this Order.

Findings of Undisputed Fact and Conclusions of Law

1. This is a civil enforcement action brought by the State of North Carolina and joined in by Plaintiff-Intervenors against the Defendant for injunctive relief. The Plaintiff and Plaintiff-Intervenors submitted separate Complaints which, together, seek injunctive relief under G.S. §143-215.6C for alleged violations of G.S. §§143-215.1(a)(1) and (a)(6), alleged violations of the National Pollutant Discharge Elimination System ("NPDES") permits, alleged violations of the groundwater standards established (at the time of the Complaint) by 15A N.C. Admin. Code Subchapter 2L ("2L Groundwater Rules"), and, in the case of Plaintiff-Intervenors' Complaints, alleged violations of various provisions of the Clean Water Act, 33 U.S.C. §§1311(a), 1342(a), and 1365(f) as set forth in those Complaints.

2. As to the plants that are the subject of this Motion (H.F. Lee Steam Station ("H.F. Lee"), Cape Fear Steam Station ("Cape Fear"), and Weatherspoon Steam Station ("Weatherspoon")), the State of North Carolina sought the identical injunctive relief as set forth in the Complaint: (1) abatement of the violations of G.S. § 143-215.1, the NPDES permits and Rule 2L Groundwater Rules, (2) assessment of the ash basins and specifically assessment of whether exceedances in groundwater constituents beyond

the compliance boundary were naturally occurring or a result of the coal ash basins, and (3) corrective action to restore groundwater quality.

3. As to these same plants, the various Plaintiff-Intervenors requested separate relief from the State of North Carolina, but relief that was substantively identical across Plaintiff-Intervenors Complaints in Intervention for each of the facilities. The Plaintiff-Intervenors sought injunctive relief under the 2L Groundwater Rules for exceedances of any constituents that were not naturally occurring and were caused by the coal ash basins, sought an assessment of those exceedances as specified in the 2L Groundwater Rules, sought implementation of any corrective actions required by the 2L Groundwater Rules, asked that the Defendant conduct sampling and testing of seeps for purposes of characterizing their constituents, and requested abatement of alleged unpermitted discharges from the coal ash basins under the Clean Water Act and the coordinate provisions of North Carolina law.

4. On August 20, 2014, the General Assembly ratified Session Law 2014-122, which includes the Coal Ash Management Act of 2014, portions of which are codified as Part 2I of Article 9 of Chapter 130A of the General Statutes (collectively "CAMA 2014"); this was permitted to become law by the Governor without signature on September 20, 2014. On June 15, 2015, the General Assembly enacted the Mountain Energy Act of 2015, which was ratified as Session Law 2015-110 and which became effective on June 24, 2015 ("2015 Mountain Energy Act"), which, among other things, amended CAMA 2014. As used herein, "CAMA" shall refer to CAMA 2014, as amended by the 2015 Mountain Energy Act.

5. CAMA amended and enacted a number of North Carolina Statutes relevant to the relief sought by the State of North Carolina and the Plaintiff-Intervenors.

a. G.S. §130A-309.210 was enacted to prohibit the construction of new coal combustion residuals surface impoundments¹ or the expansion of such existing impoundments after October 1, 2014;

b. G.S. § 130A-309.213 was enacted to require that DEQ establish a classification (high-risk, intermediate-risk, or low-risk), and schedule for closure and required remediation for all coal combustion residuals surface impoundments in North Carolina. G.S. § 130A-309.213 requires that DEQ provide for public notice and comment, and hold public hearings on such proposed classifications. DEQ must then submit proposed classifications to the Coal Ash Management Commission ("CAMC") for approval. Parties aggrieved by a final decision of CAMC may appeal that decision pursuant to Article 3 of Chapter 150B of the General Statutes. G.S. § 130A-309.214 of CAMA establishes minimum requirements applicable to the high, intermediate, and low-

¹ CAMA enacts G.S. §130A-309.201 to define a "coal combustion residuals surface impoundment" as a "topographic depression, excavation or diked area that is (i) primarily formed from earthen materials; (ii) without a base liner approved for use by Article 9 of Chapter 130A of the General Statutes or rules adopted thereunder for a combustion products landfill or coal combustion residuals landfill, industrial landfill, or municipal solid waste landfill; and (iii) designed to hold accumulated coal combustion residuals in the form of liquid wastes, wastes containing free liquids, or sludges, and that is not backfilled or otherwise covered during period of deposition. 'Coal combustion residuals surface impoundment' shall only include impoundments owned by a public utility, as defined in G.S. 62-3. 'Coal combustion residuals surface impoundment' includes all of the following: (a) An impoundment that is dry due to the deposited liquid having evaporated, volatilized, or leached. (b) An impoundment that is wet with exposed liquid. (c) Lagoons, ponds, aeration pits, settling ponds, tailing ponds, and sludge pits, when these structures are designed to hold accumulated coal combustion residuals. (d) A coal combustion residuals surface impoundment that has been covered with soil or other material after the final deposition of coal combustion residuals at the impoundment."

risk impoundments, and establishes outside dates for closure of such impoundments: December 31, 2019 for high-risk impoundments; December 31, 2024 for intermediate-risk impoundments, and December 31, 2029 for low-risk impoundments. The coal combustion residuals surface impoundments at the H.F. Lee, Cape Fear and Weatherspoon are required to be closed in conformity with the requirements of CAMA and the provisions of this Order;

c. CAMA enacted G.S. §130A-309.211 to require the assessment and, where appropriate, corrective action as to groundwater impacted by the coal ash basins at the facilities operated by the Defendant by, among other things, requiring: (1) the preparation and implementation of an approved Groundwater Assessment Plan, (2) the preparation and submission of a Groundwater Assessment Report, and (3) the preparation and implementation of any necessary Groundwater Corrective Action Plan which provides for the restoration of groundwater quality. In addition, N.C.G.S. § 143-215.1(k) was amended to eliminate the distinction between disposal systems that were permitted after 30 December 1983 and those permitted prior to that date. This provision of CAMA was recently held to have rendered moot this Court's declaratory ruling that the 2L Groundwater Rules required immediate action to eliminate the source or sources of groundwater contamination, as requested by the Plaintiff-Intervenors under those rules. The Supreme Court held that that case "has been rendered moot as a matter of both law and fact by virtue of the enactment of the revised version of N.C.G.S. § 143-215.1(k)," Cape Fear River Watch, et al. v. N.C. Env'tl. Mgmt. Comm'n, 368 N.C. 92, 100, 772 S.E.2d 445, 450 (2015), which "eliminates the distinction between facilities that were permitted before 30 December 1983 and facilities that were permitted after that

date by providing that all permitted facilities, 'without regard to the date that the system was first permitted,' are subject to the corrective action requirements of Rule .0106(d)." Id., 368 N.C. at 98, 772 S.E.2d at 449. The Environmental Management Commission has initiated the process of adopting conforming amendments into the 2L Groundwater Rules.

d. CAMA enacted G.S. § 130A-309.212 to require the identification and assessment of all discharges from CCR impoundments, the implementation of corrective action to prevent unpermitted discharges from CCR impoundments, and preparation of a plan for the identification of new discharges.

e. CAMA enacted G.S. § 130A-309.214 to require the submission of Closure Plans which must include provisions for completion of activities to restore groundwater in conformance with the requirements of the 2L Groundwater Rules. The due date for these Closure Plans will depend on the prioritization classification established under CAMA for each facility. See G.S. § 130A-309.214.

6. The Defendant has submitted groundwater assessment plans for each of the three facilities addressed in this Order. DEQ conditionally approved the plans, requiring that certain changes be addressed in the groundwater assessment reports. The Defendant has now submitted the groundwater assessment reports to DEQ, and they are currently under review.

7. In addition, during 2014, new NPDES permit applications were submitted to DEQ for the coal ash basins at these plants. As part of this process, the Defendant has submitted analyses of all seeps associated with the coal ash basins that the Defendant has identified, sampled and tested the seeps, and provided a

characterization of the chemicals found in the seeps (as sought by the relief requested by the Plaintiff-Intervenors).

8. The Defendant, in preparation for and as required by the CAMA process, conducted engineering and scientific analyses of H.F. Lee, Cape Fear and Weatherspoon and concluded that the coal combustion residuals surface impoundments at these plants should be dewatered, excavated and their contents removed to appropriate lined storage facilities or reused beneficially, as described with greater specificity below. The Defendant publicly announced these findings and conclusions on June 23, 2015. The Defendant will be seeking necessary DEQ review of the closure plans and the permits from DEQ needed to implement them.

9. As a result of these actions and statutory changes requiring further action, the Court finds that an Order on relief as to these facilities is appropriate, and the actions already taken together with those required by this Order (including dewatering, excavating and removing the contents of the coal ash basins) have remedied, or will remedy, the violations alleged in the Complaints.

10. This Court further finds that the issues alleged in the various Complaints with regard to unpermitted discharges, and with regard to violations of NPDES permits and groundwater standards at these facilities will be remedied by compliance with the provisions of this Order and the provisions of CAMA applicable to the three plants included in this Order. This Order does not resolve any issue with regard to: (1) any claims that may be pursued by DEQ pursuant to a joint enforcement agreement between DEQ and the United States Environmental Protection Agency, (2) any seeps

that are determined to be waters of the United States, or (3) whether any seeps can be addressed through NPDES permitting.

Order on Relief

11. This Court has jurisdiction over the subject matter and the parties to these actions pursuant to G.S. 7A-245 and 143-215.6C. DEQ brought the Action based on its reasonable cause to believe that Duke Energy Progress had violated or might violate provisions of G.S. 143-215.1 and the 2L Groundwater Rules.

12. Venue is proper in Wake County under G.S. 1-79 and 143-215.6C.

Specific Facility Terms

H.F. Lee Steam Station

13. Duke Energy Progress owns the H.F. Lee Steam Station, located in Wayne County, which has been retired, in that it is no longer used for the production of electricity.

14. H.F. Lee has four coal ash settling Impoundments, which are referred to in **Exhibit A** as the Active Basin, Inactive Basin 1, Inactive Basin 2, and Inactive Basin 3. Collectively, the Active Basin, Inactive Basin 1, Inactive Basin 2, and Inactive Basin 3 are referred to as "H.F. Lee Impoundments." The Active Basin no longer receives sluice water, which was water that was used to transport to the H.F. Lee Impoundments the coal ash produced when the H.F. Lee Steam Station was generating electricity. Coal ash is also stored in the Former Ash Disposal Area ("H.F. Lee Inactive Ash Area") as further identified on **Exhibit A**.

15. The H.F. Lee Impoundments are Coal Combustion Residual ("CCR") Surface Impoundments as defined in G.S. 130A-309.201(6). Upon evaluation by DEQ and full adjudication of any challenges to DEQ's evaluation, to the extent provided by

applicable law, the Inactive Ash Area may or may not be determined to be a CCR Surface Impoundment as defined in G.S. 130A-309.201(6).

16. H.F. Lee holds NPDES Permit No. NC0003417 ("Lee NPDES Permit") that authorizes and regulates discharges from permitted outfalls.

17. Duke Energy Progress shall comply with the following requirements:

a. Excavate and remove all CCR and Coal Combustion Products from the H.F. Lee Impoundments and the Inactive Ash Area (collectively, "H.F. Lee Removed Ash") to lined locations for disposal in a CCR landfill, industrial landfill, or municipal solid waste landfill or for use as structural fill or other beneficial use pursuant to applicable law, and thereafter stabilize and close the area where the H.F. Lee Impoundments and Inactive Ash Area are located pursuant to applicable law. Excavation shall include all coal ash, and such additional soil as is necessary for the protection of groundwater or as may be ordered by any regulatory agency or applicable law.

b. Defendant shall ensure that the H.F. Lee Removed Ash transferred for disposal is transferred to a lined CCR landfill, industrial landfill, or municipal solid waste landfill meeting applicable permitting, siting, construction, and engineering requirements established by applicable law, statute or regulation. The Defendant shall take all necessary steps to ensure that the disposal or reuse of H.F. Lee Removed Ash shall meet the requirements specified in **Exhibit B**, and Defendant will ensure any application for a permit submitted to DEQ shall comply with the requirements specified in Exhibit B. **DEQ neither endorses nor objects to the inclusion of Exhibit B in this Order.** DEQ shall review, and approve or deny any application for a permit for the disposal of H.F. Lee Removed Ash in accordance with applicable State statutes and

regulations. If H.F. Lee Removed Ash is used as structural fill or in another beneficial use, such as lined mine reclamation, Defendant shall ensure that it is not deposited on the surface or subsurface of the land except in a lined facility and that any application for a permit for such use submitted to DEQ shall meet the requirements set forth in **Exhibit B**. DEQ shall review, and approve or deny any application for a permit for the use of H.F. Lee Removed Ash as structural fill or other beneficial use in accordance with applicable State statutes and regulations.

c. During the removal process, sample the H.F. Lee Removed Ash in accordance with the protocol attached as **Exhibit C** and such other protocols or procedures as specified by any regulatory agency.

d. Complete investigation and undertake corrective action to eliminate groundwater violations at or beyond the compliance boundary to the extent required by G.S. § 130A-309.211, the 2L Groundwater Rules, any other applicable laws and regulations, and pursuant to a Corrective Action Plan approved by DEQ in accordance with Paragraph 21.

e. Comply with the terms and conditions of the NPDES permit, and any modified or new NPDES permit issued for this facility, pending closure of the H.F. Lee Impoundments and Inactive Ash Areas.

f. Comply with and implement an approved Plan for Identification of New Discharges in accordance with G.S. § 130A-309.212(d), attached to and included as a part of any modified or new NPDES permit issued for the facility.

g. Dewater the H.F. Lee Impoundments pursuant to the terms and limitations of a NPDES permit and in compliance with G.S. § 130A-309.214 and other applicable law.

h. Remove or permanently close all pipes currently running through or beneath the Impoundments pursuant to an approved Closure Plan.

18. Duke Energy Progress shall close the Impoundments at H.F. Lee and Inactive Ash Area should it later be determined to be a CCR Surface Impoundment (after evaluation by DEQ and full adjudication of any challenges to DEQ's evaluation to the extent that such challenges are provided for by applicable law) in accordance with all applicable provisions of CAMA and the regulations that are cited therein (including the requirement for submittal of a proposed closure plan meeting the requirements of G.S. § 130A-309.214(a)(4)), as well as the additional provisions contained in this Order (including dewatering, excavating and removing the contents of the coal ash basins).

19. The H.F. Lee Impoundments and Inactive Ash Area shall be closed according to the following timetable: Within one year of receiving the required permit(s), Duke Energy Progress shall begin dewatering the Active Basin. Defendant shall begin excavation of the H.F. Lee Impoundments within three years from the start of the dewatering process that occurs following the receipt of the required permit(s), and excavation of the H.F. Lee Impoundments shall be completed within twelve years from the start of the dewatering process that occurs following the receipt of the required permit(s). Excavation of the Inactive Ash Area shall begin no later than ten years from April 4, 2016, and shall be completed no later than twelve years from April 4, 2016.

Duke Energy Progress may be required to undertake or complete these actions sooner under CAMA, as set out in paragraph 5.b. of this Order.

20. Commencing six months after the entry of this Order on April 4, 2016, and continuing every six months thereafter until one year after the removal of the Lee Removed Ash has been completed, Duke Energy Progress shall provide a written report to the Court summarizing its actions under this Order including (1) the amount of ash removed during the previous six-month period, (2) the results of all monitoring, (3) the progress of excavation, dewatering and closure, (4) all significant activities performed pursuant to this Order during the previous six-month period, and (5) the destination and/or intended use of the Lee Removed Ash. Duke Energy Progress may utilize reports to other federal or state courts or agencies to meet this reporting requirement or any portion of this reporting requirement.

21. Within the timeframes and as required by CAMA and G.S. 130A-309.211(b), Duke Energy Progress shall submit a proposed Groundwater Corrective Action Plan to DEQ for its review and approval. The Corrective Action Plan will be designed to address any groundwater contamination as required by CAMA, G.S. § 130A-309.211, the 2L Groundwater Rules, and any other applicable laws, statutes, or regulations, but, at a minimum, to prevent contaminants from the coal ash sites from violating the 2L Groundwater Rules at or beyond the compliance boundary. For purposes of clarity, the current compliance boundary is shown on the map attached as **Exhibit A**. The actual compliance boundary is under regulatory review by DEQ and may be modified in the future, such as through permit modification or the purchase by Duke Energy Progress of additional property; provided, however, that Duke Energy

Progress, for purposes of its obligation to address groundwater contamination, will treat the compliance boundary as not extending beyond the closest shoreline of rivers or lakes.

22. No later than thirty (30) days from DEQ's approval of the groundwater corrective action plans, Duke Energy Progress shall begin implementation of the plans in accordance with the plans' schedules.

23. Notwithstanding the preceding paragraph, Defendant must comply with all applicable requirements for groundwater monitoring and assessment, and corrective action to restore groundwater quality in accordance with CAMA and the 2L Groundwater Rules.

24. Following the removal of the ash, Defendant must investigate and remediate soil and groundwater impacted by the H.F. Lee Impoundments and Inactive Ash Area in conformance with the requirements of CAMA and the 2L Groundwater Rules, and as otherwise required by law. ²

25. Within thirty (30) days of the entry of this Order on April 4, 2016, the Plaintiff-Intervenors shall have the right to sample any of the alleged unpermitted discharges. The Plaintiff-Intervenor representatives must be given access no later than five (5) days following notice and will be accompanied at all times while at the Facility for these purposes. The Plaintiff-Intervenors shall split samples with Duke Energy Progress and DEQ upon request.

² This Order does not address whether or under what circumstances, if any, a compliance boundary may be eliminated or the obligations of the parties upon elimination of a compliance boundary.

26. The terms of this Order define Duke Energy Progress' minimum obligations regarding closure. Any closure plan submitted by Duke Energy Progress shall not be inconsistent with this Order.

27. A decision by any agency on the closure plan for the H.F. Lee that is final under the North Carolina Administrative Procedure Act and otherwise appealable under applicable law may be challenged by Duke Energy Progress and/or any of the Plaintiff-Intervenors by filing a contested case in the Office of Administrative Hearings, but only to the extent it is inconsistent with this Order.

Cape Fear Steam Station

28. Duke Energy Progress owns the Cape Fear Steam Station, located in Chatham County, which has been retired, in that it is no longer used for the production of electricity.

29. Cape Fear has five Impoundments (the "1956 Ash Pond," "1963 Ash Pond," "1970 Ash Pond", "1978 Ash Pond" and "1985 Ash Pond"), one of which currently receives stormwater, as further set forth in **Exhibit D** (collectively, "Cape Fear Impoundments").

30. The Cape Fear Impoundments are Coal Combustion Residual ("CCR") Surface Impoundments as defined in G.S. 130A-309.201(6).

31. Cape Fear holds NPDES Permit No. NC0003433 ("Cape Fear NPDES Permit") that authorizes and regulates discharges from a single permitted outfall from the Impoundments.

32. Duke Energy Progress shall comply with the following requirements:

a. Excavate and remove all CCR and Coal Combustion Products from the Cape Fear Impoundments ("Cape Fear Removed Ash") to lined locations for

disposal in a CCR landfill, industrial landfill, or municipal solid waste landfill or for use as structural fill or other beneficial use pursuant to applicable law, and thereafter stabilize and close the area where the Cape Fear Impoundments are located pursuant to applicable law. Excavation shall include all coal ash, and such additional soil as is necessary for the protection of groundwater or as may be ordered by any regulatory agency or applicable law.

b. Defendant shall ensure that the Cape Fear Removed Ash transferred for disposal is transferred to a lined CCR landfill, industrial landfill, or municipal solid waste landfill meeting applicable permitting, siting, construction, and engineering requirements established by applicable law, statute or regulation. The Defendant shall take all necessary steps to ensure that the disposal or reuse of Cape Fear Removed Ash shall meet the requirements specified in **Exhibit B**, and Defendant will ensure any application for a permit submitted to DEQ shall comply with the requirements specified in Exhibit B. **DEQ neither endorses nor objects to the inclusion of Exhibit B in this Order.** DEQ shall review, and approve or deny any application for a permit for the disposal of Cape Fear Removed Ash in accordance with applicable State statutes and regulations. If Cape Fear Removed Ash is used as structural fill or in another beneficial use, such as lined mine reclamation, Defendant shall ensure that it is not deposited on the surface or subsurface of the land except in a lined facility and that any application for a permit for such use submitted to DEQ shall meet the requirements set forth in **Exhibit B**. DEQ shall review, and approve or deny any application for a permit for the use of Cape Fear Removed Ash as structural fill or other beneficial use in accordance with applicable State statutes and regulations.

c. During the removal process, sample the Cape Fear Removed Ash in accordance with the protocol attached as **Exhibit C** and such other protocols or procedures as specified by any regulatory agency.

d. Complete investigation and undertake reasonable corrective action to eliminate groundwater violations at or beyond the compliance boundary to the extent required by G.S. § 130A-309.211, the 2L Groundwater Rules, any other applicable laws and regulations, and pursuant to a Corrective Action Plan approved by DEQ in accordance with Paragraph 36.

e. Comply with the terms and conditions of the NPDES permit, and any modified or new NPDES permit issued for this facility, pending closure of the Cape Fear Impoundments.

f. Comply with and implement an approved Plan for Identification of New Discharges in accordance with G.S. § 130A-309.212(d), attached to and included as a part of any modified or new NPDES permit issued for the facility.

g. Dewater the Cape Fear Impoundments pursuant to the terms and limitations of a NPDES permit and in compliance with G.S. § 130A-309.214 and other applicable law.

h. Remove or permanently close all pipes currently running through or beneath the Impoundments pursuant to an approved Closure Plan.

33. Duke Energy Progress shall close the Cape Fear Impoundments in accordance with all applicable provisions of CAMA and the regulations that are cited therein, as well as the additional provisions contained in this Order (including dewatering, excavating and removing the contents of the coal ash basins).

34. The Cape Fear Impoundments shall be closed according to the following timetable: For the 1956, 1963, and 1970 Ash Ponds, Duke Energy Progress shall begin excavation within five years of receiving the required permits and shall complete excavation within ten years of receiving the required permits. For the 1978 and 1985 Ash Ponds, Duke Energy Progress shall begin dewatering within one year of receiving the required permit(s). For the 1978 and 1985 Ash Ponds, Duke Energy Progress shall begin excavation within three years from the start of the dewatering process that occurs after the receipt of the required permit(s), and shall complete excavation within ten years from the start of the dewatering process that occurs after the receipt of the required permit(s). Duke Energy Progress may be required to undertake or complete these actions sooner under CAMA, as set out in paragraph 5.b. of this Order.

35. Commencing six months after the entry of this Order on April 4, 2016, and continuing every six months thereafter until one year after the removal of the Cape Fear Removed Ash has been completed, Duke Energy Progress shall provide a written report to the Court summarizing its actions under this Order including (1) the amount of ash removed during the previous six-month period, (2) the results of all monitoring, (3) the progress of excavation, dewatering and closure, (4) all significant activities performed pursuant to this Order during the previous six-month period, and (5) the destination and/or intended use of the Cape Fear Removed Ash. Duke Energy Progress may utilize reports to other federal or state courts or agencies to meet this reporting requirement or any portion of this reporting requirement.

36. Within the timeframes and as required by CAMA and G.S. § 130A-309.211, Duke Energy Progress shall submit proposed Groundwater Corrective Action

Plan to DEQ for its review and approval. The Corrective Action Plan will be designed to address any groundwater contamination as required by CAMA, G.S. § 130A-309.211, the 2L Groundwater Rules, and any other applicable laws, statutes, or regulations, but, at a minimum, to prevent contaminants from the coal ash sites from violating the 2L rules at or beyond the compliance boundary. For purposes of clarity, the current compliance boundary is shown on the map attached as **Exhibit D**. The actual compliance boundary is under regulatory review by DEQ and may be modified in the future, such as through permit modification or the purchase by Duke Energy Progress of additional property; provided, however, that Duke Energy Progress, for purposes of its obligation to address groundwater contamination, will treat the compliance boundary as not extending beyond the closest shoreline of rivers or lakes

37. No later than thirty (30) days from DEQ's approval of the groundwater corrective action plans, Duke Energy Progress shall begin implementation of the plans in accordance with the plans' schedules.

38. Notwithstanding the preceding paragraph, Defendant must comply with all applicable requirements for groundwater monitoring and assessment, and corrective action to restore groundwater quality in accordance with CAMA and the 2L Groundwater Rules.

39. Following the removal of the ash, Defendant must investigate and remediate soil and groundwater impacted by the Cape Fear Impoundments in

conformance with the requirements of CAMA and the 2L Groundwater Rules, and as otherwise required by law.³

40. Within thirty (30) days of the entry of this Order on April 4, 2016, the Plaintiff-Intervenors shall have the right to sample any of the alleged unpermitted discharges. The Plaintiff-Intervenor representatives must be given access no later than five (5) days following notice and will be accompanied at all times while at the Facility for these purposes. The Plaintiff-Intervenors shall split samples with Duke Energy Progress and DEQ upon request.

41. The terms of this Order define Duke Energy Progress' minimum obligations regarding closure. Any closure plan submitted by Duke Energy Progress shall not be inconsistent with this Order.

42. A decision by any agency on the closure plan for Cape Fear that is final under the North Carolina Administrative Procedure Act and otherwise appealable under applicable law may be challenged by Duke Energy Progress and/or any of the Plaintiff-Intervenors by filing a contested case in the Office of Administrative Hearings, but only to the extent it is inconsistent with this Order.

Weatherspoon Steam Station

43. Duke Energy Progress owns the Weatherspoon Steam Station, located in Robeson County, which has been retired, in that it is no longer used for the production of electricity.

³ This Order does not address whether or under what circumstances, if any, a compliance boundary may be eliminated or the obligations of the parties upon elimination of a compliance boundary.

44. Weatherspoon contains one Impoundment (which contains inactive ash areas on the footprint of the regulated surface of the Impoundment) as set forth in **Exhibit E** ("Weatherspoon Impoundment").

45. The Weatherspoon Impoundment is a Coal Combustion Residual ("CCR") Surface Impoundments as defined in G.S. 130A-309.201(6).

46. Weatherspoon holds NPDES Permit No. NC0005363 ("Weatherspoon NPDES Permit") that authorizes and regulates discharges from permitted outfalls from the Impoundment.

47. Duke Energy Progress shall comply with the following requirements:

a. Excavate and remove all CCR and Coal Combustion Products from the Weatherspoon Impoundment ("Weatherspoon Removed Ash") to lined locations for disposal in a CCR landfill, industrial landfill, or municipal solid waste landfill or for use as structural fill or other beneficial use pursuant to applicable law, and thereafter stabilize and close the area where the Weatherspoon Impoundment is located pursuant to applicable law. Excavation shall include all coal ash and such additional soil as is necessary for the protection of groundwater or as may be ordered by any regulatory agency or applicable law.

b. Defendant shall ensure that the Weatherspoon Removed Ash transferred for disposal is transferred to a lined CCR landfill, industrial landfill, or municipal solid waste landfill meeting applicable permitting, siting, construction, and engineering requirements established by applicable law, statute or regulation. The Defendant shall take all necessary steps to ensure that the disposal or reuse of Weatherspoon Removed Ash shall meet the requirements specified in **Exhibit B**, and

Defendant will ensure any application for a permit submitted to DEQ shall comply with the requirements specified in Exhibit B. **DEQ neither endorses nor objects to the inclusion of Exhibit B in this Order.** DEQ shall review, and approve or deny any application for a permit for the disposal of Weatherspoon Removed Ash in accordance with applicable State statutes and regulations. If Weatherspoon Removed Ash is used as structural fill or in another beneficial use, such as lined mine reclamation, Defendant shall ensure that it is not deposited on the surface or subsurface of the land except in a lined facility and that any application for a permit for such use submitted to DEQ shall meet the requirements set forth in **Exhibit B**. DEQ shall review, and approve or deny any application for a permit for the use of Weatherspoon Removed Ash as structural fill or other beneficial use in accordance with applicable State statutes and regulations.

c. During the removal process, sample the Weatherspoon Removed Ash in accordance with the protocol attached as **Exhibit C** and such other protocols or procedures as specified by any regulatory agency.

d. Complete investigation and undertake reasonable corrective action to eliminate groundwater violations at or beyond the compliance boundary (as specified on the map attached as **Exhibit E**) to the extent required by G.S. § 130A-309.211, the 2L Groundwater Rules, any other applicable laws and regulations, and pursuant to a Corrective Action Plan approved by DEQ in accordance with Paragraph 51;

e. Comply with the terms and conditions of the NPDES permit, and any modified or new NPDES permit issued for this facility, pending closure of the Weatherspoon Impoundment.

f. Comply with and implement an approved Plan for Identification of New Discharges in accordance with G.S. § 130A-309.212(d), attached to and included as a part of any modified or new NPDES permit issued for the facility.

g. Dewater the Weatherspoon Impoundment pursuant to the terms and limitations of a NPDES permit and in compliance with G.S. § 130A-309.214 and other applicable law.

h. Remove or permanently close all pipes currently running through or beneath the Impoundments pursuant to an approved Closure Plan.

48. Duke Energy Progress shall otherwise close the Impoundment at Weatherspoon in accordance with all applicable provisions of CAMA and the regulations that are cited therein, as well as the additional provisions contained in this Order (including dewatering, excavating and removing the contents of the coal ash basins).

49. The Weatherspoon Impoundment shall be closed according to the following timetable: Duke Energy Progress shall start excavation within ten years of April 4, 2016 and shall complete excavation within twelve years of April 4, 2016. Defendant may be required to undertake or complete these actions sooner under CAMA, as set out in paragraph 5.b. of this Order.

50. Commencing six months after the entry of this Order on April 4, 2016, and continuing every six months thereafter until one year after the removal of the Weatherspoon Removed Ash has been completed, Duke Energy Progress shall provide a written report to the Court summarizing its actions under this Order including (1) the amount of ash removed during the previous six-month period, (2) the results of all monitoring, (3) the progress of excavation, dewatering and closure, (4) all significant

activities performed pursuant to this Order during the previous six-month period, and (5) the destination and/or intended use of the Weatherspoon Removed Ash. Duke Energy Progress may utilize reports to other federal or state courts or agencies to meet this reporting requirement or any portion of this reporting requirement.

51. Within the timeframes and as required by § 130A-309.211, Duke Energy Progress shall submit a proposed a Groundwater Corrective Action Plan to DEQ for its review and approval. The Groundwater Corrective Action Plan will be designed to address any groundwater contamination as required by CAMA, G.S. § 130A-309.211, the 2L Groundwater Rules, and any other applicable laws, statutes, or regulations, but, at a minimum, to prevent contaminants from the coal ash sites from violating the 2L rules at or beyond the compliance boundary. For purposes of clarity, the current compliance boundary is shown on the map attached as **Exhibit D**. The actual compliance boundary is under regulatory review by DEQ and may be modified in the future, such as through permit modification or the purchase by Duke Energy Progress of additional property; provided, however, that Duke Energy Progress, for purposes of its obligation to address groundwater contamination, will treat the compliance boundary as not extending beyond the closest shoreline of rivers or lakes.

52. No later than thirty (30) days from DEQ's approval of the Groundwater Corrective Action Plan, Duke Energy Progress shall begin implementation of the plans in accordance with the plans' schedules.

53. Notwithstanding the preceding paragraph, Defendant must comply with all applicable requirements for groundwater monitoring and assessment, and corrective

action to restore groundwater quality in accordance with CAMA and the 2L Groundwater Rules.

54. Following the removal of the ash, Defendant must investigate and remediate soil and groundwater impacted by the Weatherspoon Impoundment in conformance with the requirements of CAMA and the 2L Groundwater Rules, and as otherwise required by law.⁴

55. Within thirty (30) days of the entry of this Order on April 4, 2016, the Plaintiff-Intervenors shall have the right to sample any of the alleged unpermitted discharges. The Plaintiff-Intervenor representatives must be given access no later than five (5) days following notice and will be accompanied at all times while at the Facility for these purposes. The Plaintiff-Intervenors shall split samples with Duke Energy Progress and DEQ upon request.

56. The terms of this Order define Duke Energy Carolina's minimum obligations regarding closure. Any closure plan submitted by Duke Energy Progress shall not be inconsistent with this Order.

57. A decision by any agency on the closure plan for Weatherspoon that is final under the North Carolina Administrative Procedure Act and otherwise appealable under applicable law may be challenged by Duke Energy Progress and/or any of the Plaintiff-Intervenors by filing a contested case in the Office of Administrative Hearings, but only to the extent it is inconsistent with this Order.

Terms Applicable to All Facilities

⁴ This Order does not address whether or under what circumstances, if any, a compliance boundary may be eliminated or the obligations of the parties upon elimination of a compliance boundary.

58. The Court finds that the Defendant's compliance with the terms of this Order (which include compliance with CAMA as it applies to the three facilities in this Order and additional actions which have or will be taken) will provide the relief requested by the Plaintiff and Plaintiff-Intervenors in their Complaints.

59. This Order does not purport to address all requirements in CAMA, other applicable provisions of G.S. 130A or 143 or all other applicable laws, statutes and rules. Except as set forth in this Order, Defendant's obligation to comply with all other applicable statutes and rules currently in effect or that may later be enacted or promulgated is unchanged.

60. This Order shall not affect in any way any claims that may be pursued by DEQ pursuant to a joint enforcement agreement between DEQ and the United States Environmental Agency.

61. This is solely an action for injunctive relief brought under G.S. § 143-215.6C, and does not include any assessment of civil penalties.

62. This order shall not prohibit DEQ from taking any action to enforce Defendant's compliance with future NPDES permits or any requirements of CAMA, or any other applicable laws, statutes and regulations not addressed by this Order.

63. Provisions of this Order relating specifically to the removal of coal ash shall be enforceable by contempt power of the Court.

64. It shall not be considered a violation of this Order if performance of any of the obligations set forth in this Order is delayed by causes beyond the control of the Defendant, or any entity controlled by the Defendant or their contractors, despite best efforts to fulfill the obligation. Such causes include, but are not limited to, war, civil

unrest, act of God, or act of a governmental or regulatory body delaying performance or making it impossible, including, without limitation, any appeal or decision remanding, overturning, modifying or otherwise acting (or failing to act) on a permit or similar permission or action that prevents or delays an action needed for the performance of any of the work contemplated under this Order such that it prevents or substantially interferes with its performance within the time frames specified herein. The Defendant shall bear the burden of proving by a preponderance of the evidence the existence of such circumstances. Such circumstances do not include the financial inability to complete the work, increased cost of performance, or changes in business or economic circumstances.

a. In acting on applications and issuing permits, DEQ shall act as expeditiously as practicable, and consistent with all applicable deadlines established under G.S. 130A-309.203 and other applicable law.

b. The failure of a permitting authority to issue a necessary permit in a timely fashion which prevents the Defendant from meeting the requirements in this Order must be beyond the control of the Defendant, and the Defendant must have taken all steps available to them to obtain the necessary permit, including but not limited to submitting a complete permit application, responding to requests for additional information by the permitting authority in a timely fashion, and accepting lawful permit terms and conditions after expeditiously exhausting any legal rights to appeal terms and conditions imposed by the permitting authority.

c. The requirement that the Defendant use "best efforts" (as referenced above) includes using commercially reasonable efforts to anticipate any event that

delays its obligations and to address the event in a commercially reasonable manner as it is occurring or following the event such that delay is minimized to the greatest extent possible.

d. The Defendant shall notify the Court and the Plaintiff and Plaintiff-Intervenors in writing within ten (10) days of its knowledge of the event which causes or may cause delay, describing in detail the anticipated length of the delay, the precise cause or causes of the delay, the measures taken and to be taken by the Defendant to prevent or minimize the delay, and a timetable by which those measures will be implemented. Failure to comply with the notice requirements constitutes a waiver of any defense to a failure to comply with the terms and conditions of this Order. The parties may, in advance of the actual occurrence of an event causing delay, move the Court for a determination as to whether the event will excuse the delay.

65. In the event the Defendant fails to comply in a timely manner with any provision of this Order (including the timely submission of any document or plan and the completion of any such plan), it shall pay a stipulated civil penalty to the State of North Carolina for any violation as follows:

- a. \$2500.00 per day for the first twelve (12) days, and
- b. \$7500.00 per day thereafter for each violation.

66. Stipulated civil penalty payments shall be payable monthly on or before the fifteenth day of each succeeding month.

67. Any payment under this section shall not waive Defendant's duty to meet its obligations under this Order or preclude commencement of an action to compel its compliance with the terms of the Order.

68. This Order shall remain in force and effect until all obligations and terms and payment of all required penalties have been completed or satisfied (including by incorporation into a permit). Upon completion of all obligations imposed by this Order, the Plaintiff and the Plaintiff-Intervenors shall file appropriate notice and satisfaction documents with the Court.

69. This Court will maintain continuing jurisdiction to enforce the terms and conditions of this Order, to modify this Order, and to resolve disputes arising under this Order. Absent the consent of all parties, a party may seek modification or amendment of this Order only upon a showing of a substantial change of facts and circumstances such that it would no longer be equitable to enforce the terms and conditions of this Order absent such modification or amendment.

70. The entry of this Order shall terminate all proceedings as to the facilities set forth in this Order under these actions and will resolve all civil claims for injunctive relief of the State of North Carolina alleged in these actions as to these facilities as well as all civil claims of Plaintiff-Intervenors alleged in the Complaints-in-Intervention as to these facilities. This Order shall be given full preclusive effect for purposes of *res judicata* and collateral estoppel in any other litigation for issues resolved through this Order. For clarity, the issues listed in paragraph 10 above have not been resolved by this Order. Provided, however, that nothing in this paragraph shall limit the right of any party to apply to the Court to enforce compliance with the terms and conditions of this Order.

71. The Defendant has an obligation to submit closure plans for these facilities that meet the terms and conditions of this Order for review by DEQ and the Coal Ash

Management Commission, and to prosecute in good faith and use its best efforts to obtain approval for those plans. Should the Coal Ash Management Commission determine that excavation and movement of the ash subject to this Order at H.F. Lee, Cape Fear or Weatherspoon (or any of them) is inappropriate and order, under its statutory authority, that a different remediation plan is required, and if such a determination in the form of a final order is upheld on appeal, then this shall constitute a *force majeure* within the meaning of this Order. Upon the occurrence of this event, this Court shall conduct further proceedings and reserves the right to reinstate, as appropriate, any or all of the claims asserted by the Plaintiff and Plaintiff-Intervenors in these actions. Under those circumstances, the preclusive effects of this Order shall no longer be applicable.

IT IS HEREBY SO ORDERED.

This 9th day of June 2016.



The Honorable Paul C. Ridgeway
Superior Court Judge

Exhibit A



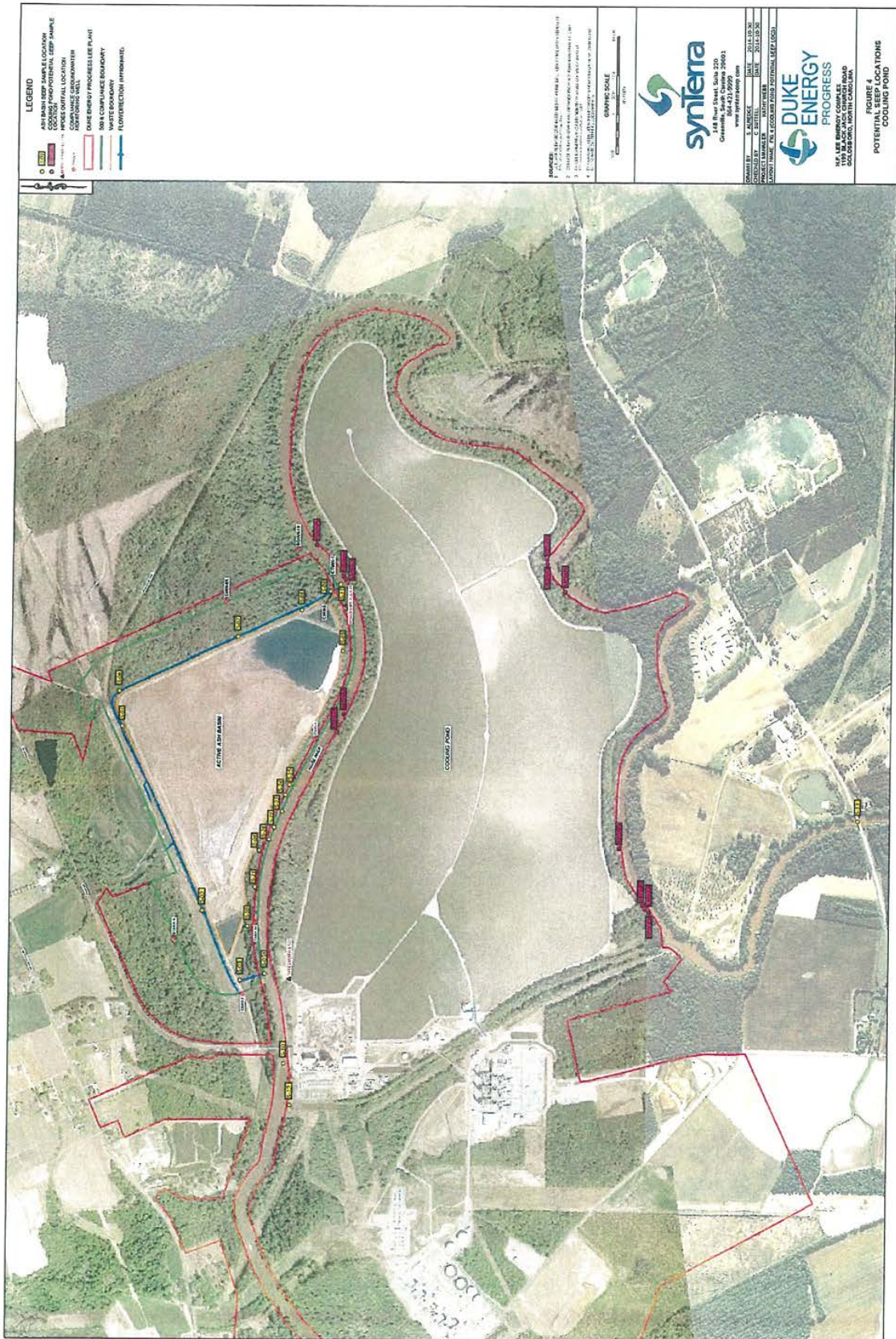




Exhibit B

Disposition of Removed Ash

The Defendant shall take all necessary steps to assure that Removed Ash shall be stored in accord with the requirements of this Exhibit.

Removed Ash under this Order will be stored in a lined landfill space meeting the requirements of G.S. 130A-309.214(a)(1)b of CAMA, including those for a Municipal Solid Waste Landfill ("MSW") meeting the requirements of 15A NCAC 13B.1600, an industrial landfill meeting the requirements of 15A NCAC 13B.0500, or a lined landfill meeting the CCR landfill liner requirements of 40 C.F.R. § 257.70(b) set forth in rules entitled "Hazardous and Solid Waste Management system: Disposal of Coal Combustion Residuals from Electric Utilities" promulgated by the United States Environmental Protection Agency ("EPA") and published on April 17, 2015, 80 Fed Reg. 21302 ("CCR rule"), and meeting all other requirements established by applicable statute, law, and regulation.

Removed Ash placed in structural fills or mine reclamations will be deposited into a properly permitted, synthetically lined facility meeting all construction, and engineering requirements of 40 CFR Part 258 (Subtitle D of RCRA) and, if disposal occurs in North Carolina, North Carolina's sanitary landfill siting and design regulation (15A NCAC 13B .0503). All structural fills shall satisfy the requirements of N.C. Gen. Stat. § 130A-309.220(b)(1) (2015).

The Defendant will not seek approval of an alternative cap under CAMA, an alternative composite liner pursuant to 40 C.F.R. § 257.70(c), a design pursuant to 40 C.F.R. § 258.40(a)(1), 15A NCAC 13B .0503(2)(d)(ii)(A), or other alternative design or liner provisions of the applicable North Carolina solid waste rules or laws, unless they have obtained prior written approval from the Conservation Group(s)¹ for that design. Approval by the Conservation Group(s) will not be unreasonably withheld. Any material that is commingled with Ash shall be disposed of in accord with applicable federal or state regulations.

Nothing in this Exhibit shall prohibit the Defendant from disposing, depositing, or processing Removed Ash through beneficial reuse including lined structural fill applications, lined mine reclamations, abrasives, filter materials, concrete, cement or such other technologies as provided for under state and federal law (including the CCR rule, as applicable). In no event shall any Removed Ash and Soil be placed in a solid waste landfill that does not meet the requirements set forth in this Exhibit, including the lining requirements set out above. If the Removed Ash and Soil is to be removed and returned at a facility to be constructed, or if it is to be removed to and stored in a structural fill site, or used for another beneficial purpose, the Removed Ash and Soil may be temporarily deposited on the surface or subsurface of the land, but shall not be permanently deposited on the surface or subsurface of the land except in a lined facility meeting all the requirements set forth in this Exhibit.

¹ The Conservation Groups shall be contacted through the Southern Environmental Law Center and are as follows: for H.F. Lee Removed Ash, Sound Rivers and Waterkeeper Alliance; for Cape Fear Removed Ash, Cape Fear River Watch and Waterkeeper Alliance; and for Weatherspoon Removed Ash, Winyah Rivers Foundation.

Exhibit C

The Removed Ash shall be analyzed using a Toxicity Characteristics Leaching Procedure ("TCLP") analysis for heavy metal parameters only (i.e., see italicized listed parameters) and shall be conducted annually on ash from each impoundment or other area from which ash is removed. Once every five years, a TCLP analysis for all parameters shall be conducted on ash from each area of Removed Ash. Any sample to undergo TCLP analysis shall be collected and preserved *in situ* (i.e., immediately upon exposure to air).

The TCLP analysis shall include the following parameters (i.e., note the leachate concentration of concern is shown in milligrams per liter in parentheses):

<i>Arsenic</i> (5.0)	1,4-Dichlorobenzene (7.5)	Nitrobenzene (2.0)
<i>Barium</i> (100.0)	1,2-Dichloroethane (0.5)	Pentachlorophenol (100.0)
Benzene (0.5)	1,1-Dichloroethylene (0.7)	Pyridine (5.0)
<i>Cadmium</i> (1.0)	2,4-Dinitrotoluene (0.13)	<i>Selenium</i> (1.0)
Carbon tetrachloride (0.5)	Endrin (0.02)	<i>Silver</i> (5.0)
Chlordane (0.03)	Hexachlorobenzene (0.13)	Tetrachloroethylene (0.7)
Chlorobenzene (100.0)	Heptachlor (and its hydroxide) (0.008)	Toxaphene (0.5)
Chloroform (6.0)	Hexachloro-1,3-butadiene (0.5)	Trichloroethylene (0.5)
<i>Chromium</i> (5.0)	Hexachloroethane (3.0)	2,4,5-Trichlorophenol (400.0)
m-Cresol (200.0)	<i>Lead</i> (5.0)	2,4,6-Trichlorophenol (2.0)
o-Cresol (200.0)	Lindane (0.4)	2,4,5-TP (Silvex) (1.0)
p-Cresol (200.0)	<i>Mercury</i> (0.2)	Vinyl chloride (0.2)
Cresol (200.0)	Methoxychlor (10.0)	Boron, Cobalt, Manganese, Thallium, Vanadium
2,4-D (10.0)	Methyl ethyl ketone (200.0)	

Additionally, Priority Pollutants not included in the TCLP analysis, plus the top 10 unidentified peaks not captured by any aforementioned test range, shall also be reported.

The ash shall also be directly tested (NOT via TCLP) for polychlorinated biphenyls (PCBs) utilizing the 209 congeners test (Method 1668).

An analysis shall be conducted on the Removed Ash from each area at a frequency that is dependent on the dry tons of ash removed or expected to be removed during the calendar year. The monitoring frequency schedule shall be as stipulated in the following table:

Amount of Product Distributed (metric tons per 365-day period)	Amount of Product Distributed (short tons per 365-day period)	Monitoring Frequency
$0 < \text{mDT/yr} < 290$	$0 < \text{DT/yr} < 319$	Once per Year
$290 \leq \text{mDT/yr} < 1,500$	$319 \leq \text{DT/yr} < 1,650$	Once per Quarter or Four Times per Year
$1,500 \leq \text{mDT/yr} < 15,000$	$1,650 \leq \text{DT/yr} < 16,500$	Once per 60 Days or

		Six Times per Year
$15,000 \leq \text{mDT/yr}$	$16,500 \leq \text{DT/yr}$	Once per Month or 12 Times per Year

The analysis shall include the following minimum parameters:

Arsenic	Magnesium	Potassium
Barium	Manganese	Selenium
Cadmium	Mercury	Silver
Calcium	Molybdenum	Sodium
Chromium	Nickel	Total Solids Percentage
Copper	pH	Zinc
Lead	Phosphorus	Boron, Cobalt, Manganese, Thallium, Vanadium

Laboratory analyses and/or operational data shall be performed/gathered on the ash such that it is representative and as it is to be distributed and shall be made by a laboratory certified for the required parameter(s) under 15A NCAC 2H .0800 or 15A NCAC 2H .1100.

Method 200.8 shall be used instead of anywhere Method 200.7 would have been used.

Exhibit D

Exhibit E

SETTLEMENT AGREEMENT

This is an AGREEMENT TO SETTLE AND FOR RELEASE OF CLAIMS (the “Agreement”) made and entered by and among North Carolina Department of Environmental Quality (“DEQ”) (formerly known as the North Carolina Department of Environment and Natural Resources) on the one hand, and Duke Energy Carolinas, LLC and Duke Energy Progress, LLC (formerly known as Duke Energy Progress, Inc.) (together, “Duke Energy”) on the other. DEQ and Duke Energy (collectively, the “Parties”) agree to the following terms as a basis upon which to resolve the issues between them relating to alleged exceedances of state groundwater standards associated with coal ash facilities at sites operated by Duke Energy and its predecessors. By this Agreement, the undersigned settling Parties mutually agree to compromise, settle, and forgo all current, prior, and future claims related to exceedances of groundwater standards associated with coal ash facilities at Duke Energy’s North Carolina facilities.

I. RECITALS

WHEREAS, Duke Energy owns and operates the following facilities that are the subject of this Agreement (collectively, the “Duke Energy Sites”):

- (1) the Allen Steam Station, located in Gaston County;
- (2) the Asheville Steam Electric Generating Plant, located in Buncombe County (the “Asheville Plant”);
- (3) the Belews Creek Steam Station (“Belews Creek Plant”), located in Stokes County;
- (4) the Buck Steam Station, located in Rowan County, which has been retired and is no longer used for the production of electricity;

- (5) the Cape Fear Steam Electric Generating Plant, located in Chatham County, which has been retired and is no longer used for the production of electricity;
- (6) the Dan River Steam Station, located in Rockingham County, which has been retired and is no longer used for the production of electricity;;
- (7) the H.F. Lee Steam Electric Generating Plant (“H.F. Lee Plant”), located in Wayne County, which has been retired and is no longer used for the production of electricity;
- (8) the Marshall Steam Station, located in Catawba County;
- (9) the Mayo Steam Electric Generating Plant, located in Person County;
- (10) the Riverbend Steam Station, located in Gaston County, which has been retired and is no longer used for the production of electricity;
- (11) the Rogers Energy Complex (formerly Cliffside Steam Station), located in Cleveland and Rutherford Counties;
- (12) the Roxboro Steam Electric Generating Plant in Person County;
- (13) the L.V. Sutton Electric Plant, located in New Hanover County (the “Sutton Plant”), which has been retired and is no longer used for the production of electricity; and,
- (14) the Weatherspoon Steam Electric Plant, located in Robeson County, which has been retired and is no longer used for the production of electricity.

WHEREAS, the National Pollutant Discharge Elimination System (“NPDES”) Permits associated with the Duke Energy Sites contain requirements for Duke Energy to monitor groundwater at the Duke Energy Sites and to report the results to DEQ.

WHEREAS, Duke Energy has at all times complied with its groundwater monitoring and reporting requirements of its NPDES Permits for each of the Duke Energy Sites.

WHEREAS, on June 17, 2011, DEQ issued its “Policy for Compliance Evaluations of Long-Term Permitted Facilities with No Prior Groundwater Monitoring Requirement” (hereinafter, the “2011 Policy for Compliance Evaluations”). The 2011 Policy for Compliance Evaluations attempts to address the situation where groundwater monitoring indicates that a “long-term permitted facility” is out of compliance with the 2L standards, including the conditions under which DENR might issue a NOV to the affected facility.

WHEREAS, the 2011 Policy for Compliance Evaluations includes a detailed flow chart dictating the steps to be taken by DEQ should Duke Energy report any exceedance of North Carolina’s groundwater standards as established pursuant to N.C.G.S. Chapter 143 and 15A N.C.A.C. Subchapter 2L at the Duke Energy Sites. Those steps include, but are not limited to: (1) verify the accuracy and significance of the results of the groundwater testing; (2) determine whether and to what extent the identified substance could be naturally occurring; and, (3) evaluate other possible sources of the identified substance.

WHEREAS, on August 26, 2014, DEQ sent Duke Energy a Notice of Violation based upon the exceedances of the State’s groundwater standards reported to DEQ for the Sutton Plant (the “Sutton NOV”).

WHEREAS, on September 20, 2014, the North Carolina Coal Ash Management Act (“CAMA”) became effective. CAMA requires, among other actions, closure and dewatering of all ash ponds at the Duke Energy Sites and dictates, in detail, a procedure for assessing, monitoring and where appropriate, remediating groundwater quality in areas around coal ash

impoundments in North Carolina that follows closely the procedures outlined in DEQ's 2011 Policy for Compliance Evaluations.

WHEREAS, Duke Energy submitted monitoring that showed exceedances of the State's groundwater standards at or beyond the compliance boundary at the Asheville Plant.

WHEREAS, on February 25, 2015, DEQ sent Duke Energy a Notice of Violation, this one based upon groundwater monitoring results reported to DEQ for the Asheville Plant (the "Asheville NOV").

WHEREAS, on March 10, 2015, DEQ assessed a \$25.1 million civil penalty (the "Penalty Assessment") against Duke Energy based upon groundwater monitoring results reported to DEQ for the Sutton Plant.

WHEREAS, on April 9, 2015, Duke Energy filed a Petition for Contested Case at the North Carolina Office of Administrative Hearings, challenging the Penalty Assessment on multiple legal and factual grounds (the "Sutton Petition").

WHEREAS, the Parties have engaged in extensive discovery regarding the arguments raised in the Sutton Petition, during which the Parties have concluded that:

- (1) The 2011 Policy for Compliance Evaluations is a current DEQ policy that was in effect at the time DEQ issued the Sutton NOV, the Asheville NOV and Penalty Assessment against Duke Energy;
- (2) The 2011 Policy for Compliance Evaluations applies to each of the Duke Energy Sites listed above;
- (3) The 2011 Policy for Compliance Evaluations states that as "long as the permittee is cooperative with the Division in taking the necessary steps to bring the facility into compliance, a notice of violation may not be necessary."
- (4) During the discovery process internal e-mails and testimony by former DENR management demonstrate that, although not expressly stated in the 2011 Policy for Compliance Evaluations, the intent at the time the 2011 Policy for Compliance Evaluations

was that corrective action would precede any enforcement and would be in lieu of monetary penalties.

WHEREAS, DEQ further acknowledges that the procedures outlined in CAMA are specifically designed to address, and will address, the assessment and corrective action of alleged groundwater contamination associated with coal ash facilities at the Duke Energy Sites. In combination with the specific requirements of CAMA, DEQ further acknowledges that this Agreement fully addresses and resolves all issues related to groundwater contamination associated with coal ash facilities at the Duke Energy Sites, including all groundwater violations alleged in the state enforcement actions currently pending in Superior Court in Wake and Mecklenburg Counties.

WHEREAS, DEQ and Duke Energy have determined that it is in the best interest of the Parties, the environment, as well as the citizens of North Carolina, that they enter into a compromise settlement to avoid the time and expense of prolonged litigation so that the Parties may focus the same on the assessment and, if necessary, corrective action of alleged groundwater standard exceedances at the Duke Energy Sites.

WHEREAS, DEQ and Duke Energy have determined that the actions provided for in this Agreement and the provisions of CAMA represent the best course for prompt assessment and remediation of any alleged groundwater standard exceedances at the Duke Energy Sites.

NOW, THEREFORE, in consideration of the promises and covenants contained herein and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, DEQ and Duke Energy agree to compromise, settle, and dismiss with prejudice all claims and causes of action related to alleged groundwater standard exceedances associated with coal ash facilities at the Duke Energy Sites upon fulfillment of the terms and conditions set forth below:

II. DUKE ENERGY'S OBLIGATIONS

A. Consistent with 15A NCAC 2L .0106 Duke Energy shall implement accelerated remediation at the Sutton Plant on the following terms and conditions:

- (1) Duke Energy will commence installation of extraction wells on the eastern portion of the Sutton Plant property where data show constituents associated with the ash basins at concentrations over the 2L standards ("Constituents of Interest") have migrated off site.
- (2) Extraction wells will be used to pump the groundwater to arrest the off-site extent of the migration. The pumped groundwater will be treated as needed to meet standards and returned either to the ash basin or the discharge canal.
- (3) This extraction and treatment system will be installed as soon as practicable following receipt of all permits and approvals from DEQ, the issuance of which will occur as soon as practicable. This accelerated groundwater remediation is in addition to and shall be performed concurrent with the coal ash impoundment closure obligations set forth in CAMA.
- (4) The extraction wells shall remain operational until such time as Duke Energy demonstrates through sampling, analysis, and appropriate modeling, and subject to DEQ's written concurrence, that off-property constituents of interest have been remediated to 2L Standards and there is no reasonable potential for future off-site migration.
- (5) As part of accelerated remediation, DEQ agrees that dry ash can be removed from the head of the ash basins under a construction storm water permit and shall expedite such construction storm water permit in order for Duke Energy to commence the removal of ash which is the source of the constituents of interest from the Sutton Plant. DEQ will issue construction storm water permits for Sutton plant within 10 days of receiving Duke Energy's complete application. Only dry ash from the head of the ash basins will be removed with no impact to wastewater treatment or water levels in the basins. DEQ shall use its best efforts to complete the process of the issuance of the NPDES permit modification at the Sutton Plant to allow for the removal of water and ash beyond the areas covered under the construction storm water permit from the Sutton Plant.

B. Consistent with 15A NCAC 2L .0106 Duke Energy shall implement accelerated remediation at the Asheville Plant, Belews Creek Plant, and H.F. Lee Plant, which are the only three other Duke Energy facilities that demonstrated offsite groundwater impacts in isolated areas that are not impacting private wells in the Comprehensive Site Assessments conducted

pursuant to CAMA. Such accelerated remediation shall be tailored to each facility's unique characteristics.

C. Petitioner agrees to pay to Respondent the sum of seven million dollars (\$7,000,000.00) (the "Payment") in full settlement of all current, prior, and future claims related to exceedances of groundwater standards associated with coal ash facilities at Duke Energy's North Carolina facilities. The Payment shall be made by check and made payable to the North Carolina Department of Environmental Quality and delivered to the following address:

North Carolina Department of Environmental Quality

Sam M. Hayes

217 West Jones Street

Raleigh, North Carolina 27603

The Payment shall be made within thirty (30) days of the receipt by Duke Energy of the acknowledgment described in part III.A. below. The Payment shall be accepted and acknowledged in writing by DEQ as "Payment In Full" in this matter within thirty-five (35) days of the execution of this Agreement.

D. Within fifteen (15) days of the receipt by Duke Energy of the acknowledgment described in part III.A. below, Duke Energy shall file and serve a Voluntary Withdrawal with Prejudice of the Sutton Petition, Case No. 15-EHR-02581, the Petition for Contested Case Hearing filed by Duke Energy related to the Notice of Regulatory Requirements dated July 9, 2014, Case No. 14-EHR-09631, and the Petition for Contested Case Hearing filed by Duke Energy related to the determination that Sutton Lake is waters of state, Case No. 15-EHR-04922.

III. DEQ'S OBLIGATIONS

A. Within five (5) days of the execution of this Agreement, DEQ shall communicate to Duke Energy, in writing, its withdrawal and rescission, with prejudice, of the Sutton NOV, the Sutton NORR, the Asheville NOV, and the Penalty Assessment.

B. DEQ shall not issue any further Notices of Violation, Notices of Regulatory Requirements, other similar notices, unilateral orders or civil penalty assessments to, file any judicial action against, or take any administrative, regulatory, or other enforcement actions against Duke Energy based on or in any way related to any previous or future groundwater monitoring results or alleged groundwater conditions at any of the coal ash facilities at any of the Duke Energy Sites, as long as Duke Energy continues to be in substantial compliance with CAMA requirements as they relate to groundwater assessment and remediation and closure of ash basins, including corrective action plans. DEQ also shall not issue Notices of Violation, Notices of Regulatory Requirements, other similar notices, unilateral orders or civil penalty assessments to, file any judicial action against, or take any administrative, regulatory, or other enforcement actions against Duke Energy based on or in any way related to the classification of Sutton Lake as waters of the State as set forth in paragraph II.D. above.

C. Except as necessary under CAMA or unless ordered or required to change, alter, modify, or amend by a court of competent jurisdiction or by the enactment or amendment of any applicable federal or state statute, rule, or regulation, or in response to an immediate threat to public health, DEQ agrees to not materially modify the groundwater monitoring terms in the existing NPDES Permits and in issuing future NPDES Permits for the Duke Energy Sites. For purposes of this provision "immediate threat to public health" shall mean circumstances beyond exceedances of the applicable provisions of 15A N.C.A.C. Subchapter 2L (the "2L Standards"). Except as provided in part III.B above, DEQ further agrees to limit the

use of the results of any groundwater monitoring required by NPDES permits or CAMA for the determination of prioritizing the coal ash impoundments and approving closure plans. This provision shall not modify the rights, duties and obligations of DEQ or Duke Energy pursuant to CAMA.

D. DEQ agrees that applicable, enforceable groundwater quality standards and naturally occurring (also known as “background”) concentrations shall only be those established pursuant to applicable provisions of the “2L Standards.”

E. Duke Energy and DEQ acknowledge that Duke Energy has been receiving and may in the future continue to receive concerns from individuals or local governments regarding alleged adverse impacts to groundwater from beneficial re-use activities conducted under Distribution of Residual Solids Permits, Ash Reuse Permits or similar permits issued by DEQ or its predecessors authorizing ash reuse programs. Except as otherwise provided by CAMA and the Distribution of Residual Solids permits, Ash Reuse Permits, or similar permits issued by DEQ, DEQ shall be responsible for investigating (including, when necessary, collecting and analyzing groundwater samples) and respond to all such concerns and shall notify Duke Energy of all such responses.

F. DEQ will issue construction storm water permits for Sutton plant within 10 days of receiving Duke Energy’s complete application. Only dry ash from the head of the ash basins will be removed with no impact to wastewater treatment or water levels in the basins. DEQ shall use its best efforts to complete the process of the issuance of the NPDES permit modification at the Sutton Plant to allow for the removal of water and ash beyond the areas covered under the construction storm water permit from the Sutton Plant.

IV. LEGAL PROVISIONS

A. Binding Nature of Agreement. The Parties represent and agree that the persons executing this Agreement have full and sufficient authority to sign and agree to be bound by the Agreement, and that this Agreement shall be binding upon DEQ and Duke Energy, and their successors and assigns, upon its execution by all Parties.

B. No Admissions. By entering into this Agreement, the Parties to this Agreement make no admission of liability, violation, or wrongdoing whatsoever, by itself, any of its affiliated companies, or any or its or their present or former officers, directors, employees, or agents.

C. Attorney's Fees, Costs, and Expenses. The Parties agree to bear their own respective attorney's fees, costs, and other expenses that have been incurred in connection with any stage of the state enforcement actions or Duke Energy's Petition for Contested Case related to the Penalty Assessment.

D. Governing Law and Interpretation. This Agreement shall be governed and interpreted in accordance with the laws of the State of North Carolina without regard to the conflict of laws provisions of North Carolina or any other state, and any provision herein that violates a statute or rule shall be void and unenforceable.

E. Enforceability and Remedies for Breach. The Parties stipulate and agree that this Agreement may be enforced in any court of competent jurisdiction in North Carolina, and that venue is appropriate in either Wake or Mecklenburg County. The Parties' sole and exclusive remedy for breach of this Agreement shall be an action for specific performance or injunction. In no event shall any Party be entitled to monetary damages for breach of this Agreement. In addition, no legal action for specific performance or injunction shall be brought or maintained

until: (a) the non-breaching Party provides written notice to the allegedly breaching Party which explains with particularity the nature of the claimed breach, and (b) within thirty (30) days after receipt of said notice, the allegedly breaching Party fails to cure the claimed breach or, in the case of a claimed breach which cannot be reasonably remedied within a thirty (30) day period, the allegedly breaching Party fails to commence to cure the claimed breach within such thirty (30) day period, and thereafter diligently completes the activities reasonably necessary to remedy the claimed breach. This Agreement may be introduced as evidence in any action involving either or both Parties for the purpose of implementing its terms.

F. Severability. The invalidity or unenforceability of any provision of this Agreement shall in no way affect the validity or enforceability of any other provision; the invalid or unenforceable provision shall be stricken, without assessing damages or imposing penalties to either Party arising out of said provisions by any court of competent jurisdiction.

G. Headings. The headings used in this Agreement are for convenience of reference only and shall in no way define, limit, expand or otherwise affect the meaning of any provision of this Agreement.

H. Counterparts. This Agreement may be executed in two or more counterparts, each of which shall be deemed to be an original, but all of which together shall constitute one and the same instrument.

I. Amendment. This Agreement may not be modified, altered or changed except in a written document that is signed by all Parties and that makes specific reference to this Agreement.

J. Entire Agreement. This Agreement sets forth the entire agreement between the Parties, and fully supersedes any prior agreements or understandings between the Parties related

to the subject matter of this Agreement, including but not limited to alleged groundwater standard exceedances associated with coal ash ponds at the Duke Energy Sites.

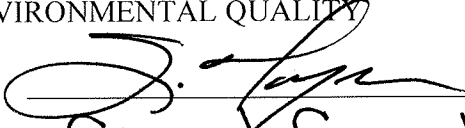
K. Review and Signing. Each Party and counsel for each Party has reviewed this Agreement. Accordingly, this Agreement shall be construed without regard to any presumption or other rule of construction requiring resolution of ambiguities against the drafting Party.

L. The Parties agree that this Agreement does not affect in any way the Joint Enforcement Agreement between DEQ and U.S. EPA, the subject of which does not involve any alleged groundwater standard exceedances associated with coal ash facilities at the Duke Energy Sites.

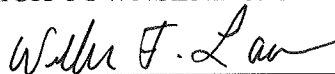
[Signature page follows]

IN WITNESS WHEREOF, DEQ and Duke Energy, and their respective counsel have executed this Agreement as of September 29, 2015.

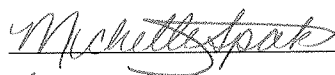
NORTH CAROLINA DEPARTMENT OF
ENVIRONMENTAL QUALITY

By: 
Its: General Counsel
Date: 9/29/15


KILPATRICK TOWNSEND & STOCKTON LLP

By: 
Its: _____
Date: 9/29/2015


DUKE ENERGY CAROLINAS, LLC

By: 
Its: Associate General Counsel
Date: 9/29/2015

DUKE ENERGY PROGRESS, LLC

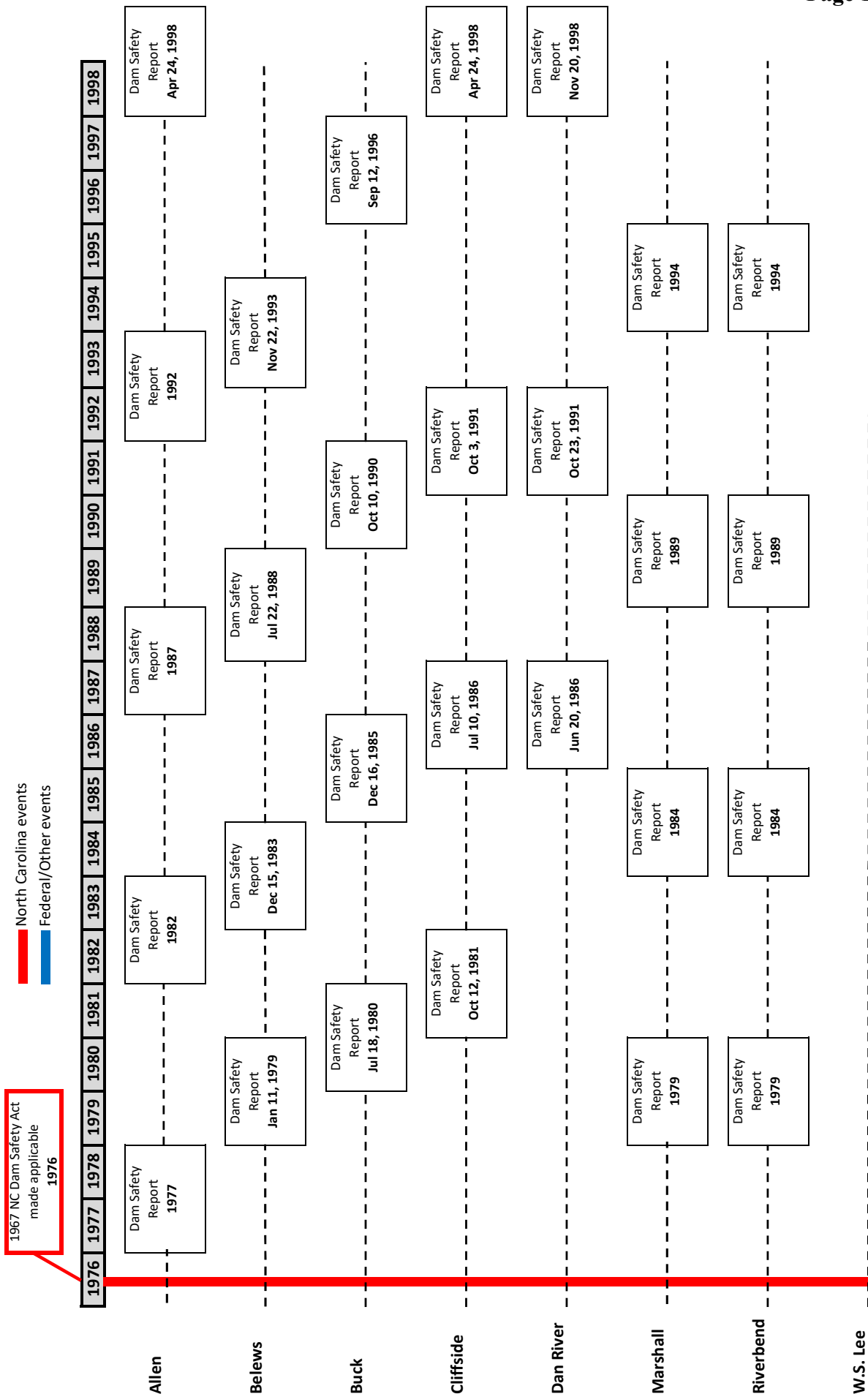
By: 
Its: Associate General Counsel
Date: 9/29/2015

McGUIREWOODS LLP

By: 
Date: 9/29/15

Duke Energy Carolinas
CCR Timeline

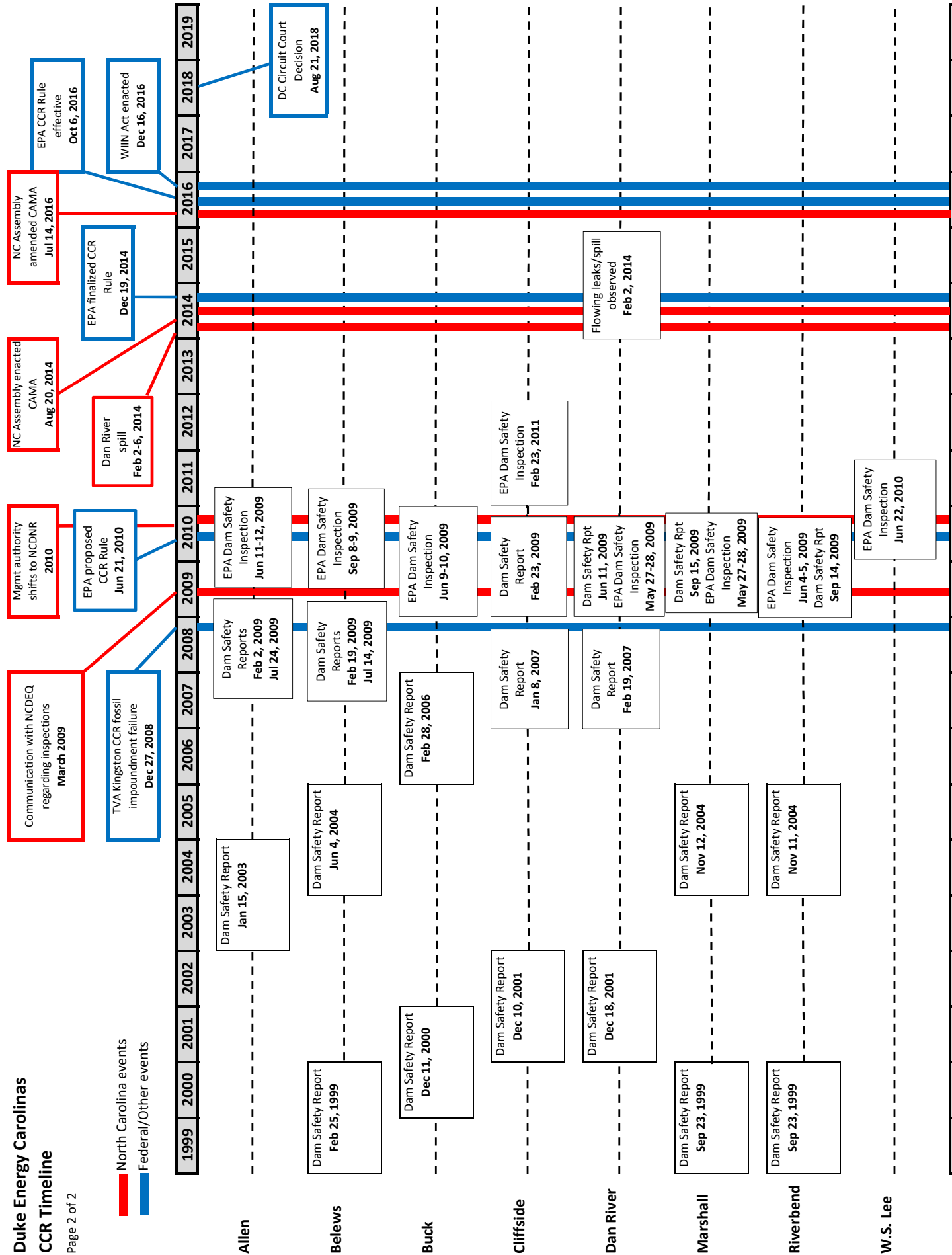
Page 1 of 2



Duke Energy Carolinas CCR Timeline

Page 2 of 2

North Carolina events
Federal/Other events



Memorandum



Duke Energy, CCP Closure Engineering

Date: November 03, 2016

To: Mehdi Maibodi

From: Charles Smith

Reviewed by:

Subject: Closure Options Evaluation
Allen Steam Station
Belmont, Gaston County, North Carolina

Duke Energy Carolinas, (Duke Energy) has reviewed the draft *Closure Options Evaluation* for the ash basin located at Duke Energy's Allen Steam Station (facility or site), located at 253 Plant Allen Road, Belmont, Gaston County, North Carolina, prepared by AECOM dated February 19, 2016. The draft *Closure Options Evaluation* involved developing ash basin closure strategies and evaluating these options relative to one another. A conceptual-level design for each closure option was developed to provide required inputs to enable this comparison. The evaluation criteria and process defined in the February 19, 2016 draft *Evaluation* were used to rank the closure options and the selected option will be advanced to permit level design.

Since completion of the draft *Closure Analysis Evaluation*, additional groundwater modeling data and other information has become available. In lieu of revising and finalizing the draft *Evaluation* in its entirety, Duke Energy has reviewed and revised the scoring matrix to include results of groundwater modeling and other information since developed to evaluate potential changes to the proposed closure program. This memorandum presents a summary of the draft Evaluation including an overview of the closure options evaluated, the revised Draft Scoring for Evaluation of Closure Options, a discussion of any significant changes in the draft Evaluation and Draft Scoring for Evaluation of Closure Options (included herein), and identifies the most favorable option based on the outcome of the review.

CLOSURE OPTIONS

For the Allen Steam Station, AECOM in conjunction with Duke Energy developed the following five conceptual closure options for evaluation:

- Option 1: Closure in Place (CIP) with Limited Footprint Reduction
- Option 2: Hybrid Option 1 (Footprint Reduction and Closure in Place)
- Option 3: Hybrid Option 2 (Additional Footprint Reduction and Closure in Place)
- Option 4: Closure by Removal and Construction of New Onsite Landfill within the Active Ash Basin (AAB) Footprint
- Option 5: Closure by Removal and Disposal of Excavated Ash in an Offsite Landfill

Option 1 consists of excavating ash from the western portion of the Retired Ash Basin (RAB) to fill and regrade Ash Fill 2 and the area to the north of the RAB Landfill. In addition, ash from the western portion of the AAB will be excavated and used to fill and regrade the remaining area of the AAB. Following these excavation and placement activities, the ash basins will be capped with an infiltration barrier/cap system meeting the requirements of the Federal CCR Rule.

Option 2 consists of the same elements as Option 1 for the RAB, but differs with respect to the AAB. The western and southeastern portions of the AAB will be excavated and used to fill and regrade the remaining area of the AAB. This option further reduces/optimizes the footprint of the final AAB closure area in comparison to Option 1. Following these excavation and placement activities, the ash basins will be capped with an infiltration barrier/cap system meeting the requirements of the Federal CCR Rule. This option also involves partial removal of the AAB dam.

Option 3 consists of the same elements as Option 1 for the RAB, but differs with respect to the AAB. The western portion and Cells 1, 2, and 3 of the AAB will be excavated and used to fill and regrade the remaining area of the AAB. This option further reduces/optimizes the footprint of the final AAB closure area in comparison to Options 1 and 2. Following these excavation and placement activities, the ash basins will be capped with an infiltration barrier/cap system meeting the requirements of the Federal CCR Rule. This option also involves partial removal of the AAB dam.

Option 4 consists of the excavation of ash materials from the RAB and AAB, and the placement of these excavated materials in a new, on-site, lined landfill system. It is proposed that the new landfill system be located within the area of the current AAB to reduce the material handling and hauling effort. This option also involves full removal of the RAB and AAB dam.

Option 5 consists of the same elements as Option 4, but the excavated ash materials are to be disposed in an existing, off-site, lined landfill system. This option also involves full removal of the

RAB and AAB dam.

A more detailed overview of each closure option is presented in the draft Closure Options *Evaluation*. Also included in the draft Evaluation and not reproduced herein are estimated quantities of ash and soil materials associated with each closure option, figures detailing each option, order of magnitude comparative costs for each option, and other additional information developed to support the comparisons.

EVALUATION MATRIX

Duke Energy has prepared a scoring matrix to provide consistent evaluation of closure options for each of their various site locations. This scoring evaluation tool is attached and considers the following primary criteria:

- Environmental Protection and Impacts
- Cost
- Schedule
- Regional Factors
- Constructability

Different overall weights have been programmatically assigned to these criteria and may not be changed. Detail application of each of these criteria to the selected closure options is presented in the draft *Evaluation*. This includes discussion about project design, permitting, and implementation schedule for the options.

The draft Evaluation considered limited footprint reduction for the closure in place option in which the northwestern and southwestern fingers of the RAB and the far western portion of the AAB were to be closed by removal. As the design of Option 1 – Closure In Place progressed, and additional groundwater information became available, Duke Energy requested that AECOM provide an analysis to determine the feasibility of closing the western fingers by removal. The results of the analysis indicated that it would cost approximately \$3,000,000 extra to close the fingers by removal rather than cap them in place with no foreseeable environmental benefit. Therefore, it was decided to proceed with a design without the limited footprint reduction. This will increase the capped area and reduce the amount of earthwork required for the closure in place option. However, the offset effects of the changes as well as the percent magnitude of the changes will not result in a different option being identified as the preferred option.

Appendix

Evaluation Criteria and Results

The scoring matrix provided in the attached table, scores each option on a scale of 0 (least favorable) to 10 (most favorable) for each of the specified criteria. The scores for each option are then summed based on specified criterion weighting, resulting in an overall weighted score for each option. The results of the scoring evaluation for the Mayo closure options are summarized in the following table:

Criterion	Option				
	1	2	3	4	5
Environmental Protection and Impacts	2.6	2.6	2.6	2.5	2.3
Cost	2.8	2.6	2.6	2.5	0.7
Schedule	1.5	1.3	1.3	0.0	0.5
Regional Factors	1.1	1.1	1.1	1.0	0.2
Constructability	0.4	0.3	0.3	0.1	0.2
Total Score	8.4	7.9	7.9	6.1	3.9

CLOSING

Based on an evaluation of the criteria established by Duke Energy (environmental protection/impacts, cost, schedule, regional factors and constructability), Option 1 Closure in Place is identified as the most favorable option, and can be implemented because of the Low-Risk classification by NCDEQ. Even though the overall scores changed and the difference in scores between the highest scoring and second highest scoring options was reduced, the most favorable option identified remains consistent with that identified in the draft Evaluation.

DRAFT

Site Name: Allen Steam Station
Date: 3/7/17

Draft Scoring for Evaluation of Closure Options
Closure Options Evaluation Worksheet
Ash Basin Closure - Master Programmatic Document
Duke Energy

1
1

= Option-Specific User Input
= Calculated Value

Placeholder values have been entered in "User Input" cells to prevent division by zero error text in calculated score cells.

Threshold Criteria: All closure options must comply with the following threshold criteria based on Duke Energy Guiding Principals for Ash Basin Closure	
1.	Provide continued geotechnical stability meeting appropriate safety factors under applicable loading conditions
2.	Provide flow capacity and erosion resistance during design storm and flooding conditions
3.	Effectively mitigate groundwater impacts (in conjunction with GW remediation where present)
4.	Comply with applicable state and federal regulations (e.g. North Carolina Coal Ash Management Act)

Option	Description
1	Closure in Place
2	Hybrid Closure Option 1: Footprint Reduction Within the Ash Basin
3	Hybrid Closure Option 2: Significant Footprint Reduction Within the Ash Basin
4	Closure by Removal: Onsite Landfill Within the Active Ash Basin Footprint
5	Closure by Removal: Offsite Landfill Disposal
A	
B	

Note: Options that did not meet threshold criteria should be listed in the Options Summary table above for completeness

Environmental Protection and Impacts Criterion	Weight: Scoring System	Required Input	30%	Units	User Input					Value that Scores 10		Value that Scores 0		Calculated or User Selected Score					Criterion Weight	Contribution to Total Score																	
					Option 1	Option 2	Option 3	Option 4	Option 5	Option 1	Option 2	Option 3	Option 4	Option 5	Option 1	Option 2	Option 3	Option 4			Option 5																
Modeled surface water impact	Refer to EM Sub-Scoring Sheet				This Area Not Used For Interpretation of Environmental Modeling Results												8	8	8	8	8	21%	6.3%														
Modeled off-site impact	Refer to EM Sub-Scoring Sheet				This Area Not Used For Interpretation of Environmental Modeling Results												10	10	10	10	10	43%	12.9%														
Groundwater impact beyond the waste boundary	Refer to EM Sub-Scoring Sheet				This Area Not Used For Interpretation of Environmental Modeling Results												6	6	6	7	7	21%	6.3%														
Air emissions off-site (based on miles driven)	Interpolation. Min value scores 10. Max value scores 0.	Truck miles driven								0	0	100					10	10	10	10	0	5%	1.5%														
Air emissions on-site (based on gallons of fuel consumed) from closure implementation	Interpolation. Min value scores 10. Max value scores 0.	Gallons of fuel consumed								4,670,000	12,000,000	12,300,000	36,000,000	19,000,000	4670000	360000000	10	8	8	0	5	5%	1.5%														
Avoidance of greenfield disturbance	Interpolation. Min value scores 10. Max value scores 0.	Disturbed acres of greenfield								0	5	5	10	91	0	91	10	9	9	9	0	5%	1.5%														
Weighted Totals (Contribution to Total Score)																			2.6	2.6	2.6	2.6	2.5	2.3													
Cost Criterion	Weight: Scoring System	Required Input	35%	Units	User Input					Value that Scores 10		Value that Scores 0		Calculated or User Selected Score					Criterion Weight	Contribution to Total Score																	
					Option 1	Option 2	Option 3	Option 4	Option 5	Option 1	Option 2	Option 3	Option 4	Option 5	Option 1	Option 2	Option 3	Option 4			Option 5																
Closure Cost	Interpolation. Min value scores 10. Max value scores 0.	Closure Cost		USD	\$76,000,000	\$184,000,000	\$193,000,000	\$325,000,000	\$1,181,000,000	\$ 76,000,000.00	\$ 184,000,000.00	\$ 193,000,000.00	\$ 325,000,000.00	\$ 1,181,000,000.00	\$ 76,000,000.00	\$ 1,181,000,000.00	10.0	9.0	8.9	7.7	0.0	80%	28.0%														
Operation, Maintenance and Monitoring Cost		OM&M Cost		USD	\$5,300,000	\$4,700,000	\$4,700,000	\$3,800,000	\$2,000,000	\$ 2,000,000.00	\$ 4,700,000.00	\$ 4,700,000.00	\$ 3,800,000.00	\$ 2,000,000.00	\$ 2,000,000.00	\$ 5,300,000.00	0.0	1.8	1.8	4.5	10.0	20%	7.0%														
Weighted Totals (Contribution to Total Score)																			2.8	2.6	2.6	2.5	0.7														

DRAFT

Site Name: Allen Steam Station
Date: 3/7/17

Draft Scoring for Evaluation of Closure Options
Closure Options Evaluation Worksheet
Ash Basin Closure - Master Programmatic Document
Duke Energy

1	= Option-Specific User Input
1	= Calculated Value

Placeholder values have been entered in "User Input" cells to prevent division by zero error text in calculated score cells.

Schedule Criterion	Weight: Scoring System	Required Input	15%	Units	Option 1	Option 2	Option 3	Option 4	Option 5	Value that Scores 10	Value that Scores 0	Calculated or User Selected Score	Option 1	Option 2	Option 3	Option 4	Option 5	Criterion Weight	Contribution to Total Score		
Initiation Time	Interpolation. Min value scores 10. Max value scores 0.	Time to move first ash	Months	30	36	36	54	36	36	30	54		10	8	8	0	8	30%	4.5%		
Construction Duration		Estimated durations	Months	76	88	88	210	201	201	76	210		10	9	9	0	1	70%	10.5%		
Weighted Totals (Contribution to Total Score)																					
Regional Factors Criterion	Weight: Scoring System	Required Input	15%	Units	Option 1	Option 2	Option 3	Option 4	Option 5	Value that Scores 10	Value that Scores 0	Calculated or User Selected Score	Option 1	Option 2	Option 3	Option 4	Option 5	Criterion Weight	Contribution to Total Score		
Plan or potential for beneficial reuse of site	Subjective				Not Used For Subjective Scoring										1	1	1	1	1	5%	0.8%
Imported soil needs	Interpolation. Min value scores 10. Max value scores 0.	Soil Imported	CY	1,310,000	860,000	1,900,000	237,000	237,000	237,000	237000	1900000		4	6	0	0	10	5%	0.8%		
Beneficial reuse of CCR	Interpolation. Max value scores 10. Zero value scores 0.	Fraction Used	None	0	0	0	0	0	0	0	0		0	0	0	0	0	15%	2.3%		
Transportation impact (based on miles driven)	Interpolation. Min value scores 10. Max value scores 0.	Miles Driven	Miles	0	0	0	0	10	100	0	100		10	10	10	10	9	65%	9.8%		
Noise impact due to on-site activity (based on proximity of neighbors to on-site work areas)	Subjective 0 to 10: 10 is the least noise; 0 is the most noise.											Not Used For Subjective Scoring	9	7	7	0	5	5%	0.8%		
View impact (based on final height of storage facility and land uses within viewshed)	Subjective 0 to 10; 10 is the least visual; 0 is the most visual.																		5%	0.7%	
Weighted Totals (Contribution to Total Score)																					
Constructability Criterion	Weight: Scoring System	Required Input	5%	Units	Option 1	Option 2	Option 3	Option 4	Option 5	Value that Scores 10	Value that Scores 0	Calculated or User Selected Score	Option 1	Option 2	Option 3	Option 4	Option 5				
Consider stormwater management, geotechnical, and dewatering	Subjective 0 to 10: 10 is the least complicated; 0 is the most complicated											Not Used For Subjective Scoring									
Weighted Totals (Contribution to Total Score)																					
Total Score For Each Option (On a Scale of 0 to 10)																					
				8.4	7.9	7.9	6.1	3.9													

Memorandum



Duke Energy, CCP Closure Engineering

Date: March 22, 2017
To: Mehdi Maibodi
From: Henry Taylor
Reviewed by: John Clemmer
Subject: Closure Options Evaluation
Belews Creek Steam Station
Belews Creek, Stokes County, North Carolina

Duke Energy has reviewed the draft *Closure Options Evaluation* for the ash basin located at Duke Energy's Belews Creek Station (facility or site), located at 3195 Pine Hall Rd, Belews Creek, Person County, North Carolina, prepared by AECOM dated February 12, 2016. The draft *Closure Options Evaluation* involved developing ash basin closure strategies and evaluating these options relative to one another. A conceptual-level design for each closure option was developed to provide required inputs to enable this comparison. The evaluation criteria and process defined in the February 12, 2016 draft *Evaluation* were used to rank the closure options and the selected option will be advanced to permit level design.

Since completion of the draft *Closure Analysis Evaluation*, additional groundwater modeling data and other information has become available. In lieu of revising and finalizing the draft *Evaluation* in its entirety, Duke Energy has reviewed and revised the scoring matrix to include results of groundwater modeling and other information since developed to evaluate potential changes to the proposed closure program. This memorandum presents a summary of the draft *Evaluation* including an overview of the closure options evaluated, the revised scoring table, a discussion of any significant changes in the draft evaluation and scoring table (included herein), and identifies the most favorable option based on the outcome of the review.

CLOSURE OPTIONS

For the Belews Creek Steam Station, AECOM in conjunction with Duke Energy developed the following five conceptual closure options for evaluation:

- Option 1: Closure-In-Place
- Option 2: Hybrid Closure
- Option 3: Closure-By-Removal #1(Onsite Landfill Inside the Excavated Ash Basin)
- Option 4: Closure-By-Removal #2 (Onsite Landfill Outside the Ash Basin)
- Option 5: Closure-By-Removal #3 (Off-Site Third Party Landfill)

Option 1 consists of leaving the ash material within the Ash Basin, which will be capped with an infiltration barrier/cap system meeting the requirements of the Federal CCR Rule and CAMA.

Option 2 consists of excavating ash materials from the proposed Closure-by-Removal Areas and the subsequent placement of these ash materials within the proposed consolidated Hybrid Ash Closure Area.

Following these excavation and placement activities, the Hybrid Ash Closure Area will be capped with an infiltration barrier/cap system meeting the requirements of the Federal CCR Rule and CAMA.

Option 3 consists of removing free water. Installing temporary wastewater treatment system, as needed. Excavate the ash area that was mainly under water at the start of the project. Stack the excavated ash on top of the existing ash delta, away from the excavation slope. Construct new temporary perimeter berm for the ash delta area. Construct a temporary stabilized slope wedge as needed. Construct a lined landfill in the excavated ash basin footprint. Excavate the stacked and ash delta ash and place in landfill and cap using the excavated soil from the dam (in addition to geosynthetics). Complete dam removal and restore excavated areas to stable and non-erodible condition.

Option 4 consists of Remove free water. Installing a temporary wastewater treatment system, as needed. Construct a lined landfill outside the ash basin footprint within the site property. Excavate the ash from the basin, place in the landfill, cap using the soil from the dam (in addition to geosynthetics). Complete dam removal and restore excavated areas to stable and non-erodible condition. Groundwater remediation and/or monitoring, if/as needed.

Option 5 consists of removing free water. Installing a temporary wastewater treatment system, as needed. Excavate the ash from the basin, moisture condition to be ready for hauling, and send for offsite disposal at a location (e.g. landfill or structural fill) identified by Duke. Complete dam

removal and restore excavated areas to stable and non-erodible condition. Groundwater remediation and/or monitoring, if/as needed.

A more detailed overview of each closure option is presented in the draft *Evaluation*. Also included in the draft *Evaluation* and not reproduced herein are estimated quantities of ash and soil materials associated with each closure option, figures detailing each option, order of magnitude comparative costs for each option, and other additional information developed to support the comparisons.

EVALUATION MATRIX

Duke Energy has prepared a scoring matrix to provide consistent evaluation of closure options for each of their various site locations. This scoring evaluation tool is attached and considers the following primary criteria:

- Environmental Protection and Impacts
- Cost
- Schedule
- Regional Factors
- Constructability

Different overall weights have been programmatically assigned to these criteria and may not be changed. However, within each criteria there are various categories that have default values for their weighted contribution to the overall criteria score and those individual categories may have their weighting adjusted based on site conditions. Detail application of each of these criteria to the selected closure options is presented in the draft *Evaluation*. This includes discussion about project design, permitting, and implementation schedule for the options.

No changes have been made to the evaluated options since the draft *Evaluation*.

Evaluation Criteria and Results

The scoring matrix provided in the attached table, scores each option on a scale of 0 (least favorable) to 10 (most favorable) for each of the specified criteria. The scores for each option are then summed based on specified criterion weighting, resulting in an overall weighted score for each option. The results of the scoring evaluation for the Belews Creek closure options are summarized in the following table:

Criterion	Option				
	1	2	3	4	5
Environmental Protection and Impacts	2.1	2.2	2.5	2.4	2.2
Cost	3.2	3.1	2.1	2.1	0.7
Schedule	1.5	1.2	0.0	0.2	0.7
Regional Factors	1.4	1.4	1.1	1.0	0.2
Constructability	0.5	0.2	0.0	0.3	0.3
Total Score	8.8	7.9	5.6	5.9	4.0

CLOSING

Based on an evaluation of the criteria established by Duke Energy (environmental protection/impacts, cost, schedule, regional factors and constructability), Option 1 Closure-in-Place is identified as the most favorable option, and can be implemented because of the Low-Risk classification by NCDENR.